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DIVISION OF FORENSIC SCIENCE

DEPARTMENT OF JUSTICE
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MAY 1982

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DEATH INVESTIGATION TRAINING

The Division of Forensic Science receives brochures on several out-of-state courses every year. These are all open to coroners, attorneys and law enforcement.

May 3-7	St. Louis M.E. George Gantner, M.D. St. Louis, MO
May 13 - 15	Detroit M.E. Werner Spitz, M.D. Detroit, MI
May 24 - 28	Miami M.E. Joe Davis, M.D. Key West, FL
June 13 - 19	IACME Toronto, CAN
Oct. 4 - 8	St. Louis, MO

Further information can be provided by this office.

FORENSIC CONSULTANTS

Drs. John Pfaff, Ken Mueller and myself are providing 24 hour coverage to the entire state. The exact schedule is on the back of this page. We spend considerable time and effort to keep current in medicolegal death investigation. It is strongly recommended that associate medical examiners call one of us before an autopsy on homicides or deaths of questionable causes.

MAY 1982

ON CALL SCHEDULE - MONTANA STATE MEDICAL EXAMINER

275 W. Front Street
Missoula, Montana 59802

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 KEN MUELLER
2 KEN MUELLER	3	4	5	6	7	8 JOHN PFAFF
9 JOHN PFAFF	10	11	12	13	14	15 RON RIVERS
16 RON RIVERS	17	18	19	20	21	22 JOHN PFAFF
23 JOHN PFAFF 30 RON RIVERS	31 24	25	26	27	28	29 RON RIVERS

Telephone Numbers: State Office - 728-4970
WATS Line - 243-5796

Home Phone: Dr. Ron Rivers- 728-2033 (Home)
(week nights call unless otherwise indicated)

Dr. John Pfaff - Great Falls
Hospital - 727-3333
Home - 727-3905

Dr. Ken Mueller- Billings
Hospital - 657-7000
Home - 248-3024

MAY 1982
GUNSHOT RESIDUES
R. L. Rivers, M.D.

ANSWERS:

1. It is useless to take swabs on a living subject longer than four hours after the gun has been fired. Even if the hands have not been washed or stuck in a pocket, the normal sweat of a person will bathe the trace residues off.

   However, a dead subject will have residues forever depending on how well the hands are protected. In this example the victim died only two hours after being shot. The hands of a patient are not ordinarily washed before surgery so there could be a chance of getting a positive test. However, anytime a victim's hands are not immediately covered with new, clean, paper bags there is a possibility of the loss of residue and worse, the contamination of the hands. Anybody who has touched a recently fired gun can contaminate the hands.

2. All revolvers will leave gunshot residues. But most .22 ammunition, except FEDERAL®, does not contain antimony and barium. Antimony and barium are two metals whose simultaneous occurrence any place other than gunshot or primer residue is extremely unlikely. The small primer, which ignites from the force of the firing pin, ignites the gunpowder or main propellant charge in a bullet. The primer contains these chemicals as well as many others, but all the other chemicals are too common to be of significant benefit.

   These two elements are typically deposited on the thumb and the index finger beneath the cylinder gap of a revolver. But all firearms leak the gases to a certain extent. If two hands are used, either or both may have deposits so swab the right and left hands in all cases.

   Typically, more than 300 ng of barium and 80 ng of antimony are found on a shooter's hands after firing a handgun. The average background level is 25 and 5 ng (parts per billion) of barium and antimony respectively. The Albuquerque Police Laboratory has established that 150 ng barium and 30 ng antimony are the minimum levels necessary for primer residue to be positive. This level is less than the typical deposit, but it is six times the average background.

   There are antimony mines in Montana so both barium and antimony must be present in the requisite amounts before a test is called positive; the presence of other metals alone is insufficient.

MAY 1982
GUNSHOT RESIDUES
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"I didn't know the gun was loaded." The police chief asked himself how many times he had heard this before. And then a second familiar statement by the homicide suspect, "She grabbed the gun and it just went off. I didn't mean to shoot her."

Eight hours previously the victim had been rushed to the hospital with a gunshot wound to the chest. She had died in surgery two hours later.

"Well, we better swab his hands for the gunshot residue test.", the sergeant noted. "Forget it.", answered the chief.

"Well then, I guess we don't need to swab the victim's hands either, especially since she's been in the hospital." The chief replied, "What kind of gun was used?". "A .357 revolver," answered the sergeant. "Get the swabs on her", said the chief.

QUESTIONS:

1) Why take swabs on the victim and not the suspect?

2) What type of revolver will <u>not</u> leave gunshot residues?

3) How do you interpret a gunshot residue test?

ANSWERS CONTINUED:

3. There is a 70% correlation between a positive test and the act of firing a handgun. In the other 30% the values are too low to be positive but we must avoid ever calling a false positive. Remember this means positive for firing a gun or handling a recently fired gun.

   A negative test is fairly frequently seen in autoloaders, rifles and shotguns. Even revolvers may not always leave a residue.

NOTE: Bill Newhouse, our Firearms and Toolmark Examiner, recommends use of the SIRCHIE^{R} gunshot residue kit for taking samples.

The Aerospace Corporation in El Segundo, California performs electron microscope analysis on .22 calibre residues but they require a special kit.

REFERENCES:

1) Jerry F. O'Donnell, PhD. APD Crime Lab

2) "Detection of Gunshot Residue by Use of the Scanning Electron Microscope" R. S. Nesbitt, J. E. Wessel and P. F. Jones. Journal of Forensic Sciences, Vol. 21, No. 3, 1976